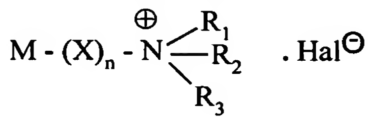
CLAIMS

20-A compound selected from those of formula (Ia) or (Ib) :



(Ia)

wherein :

M represents a molecule that can be used for the treatment or diagnosis of pathologies caused by attack on cartilage,

R_1, R_2 and R_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group,

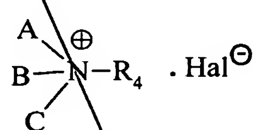
or R_1, R_2 and R_3, together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle,

X represents a linear or branched (C_1-C_6)alkylene chain in which one or more $-CH_2-$ groups are optionally replaced by a sulphur atom, an oxygen atom, an -NR- group (wherein R represents a linear or branched (C_1-C_6)alkyl group), a -CO- group, a -CO-NH- group, a $-CO_2-$ group, an -SO- group or an $-SO_2-$ group,

n represents 0 or 1, and

Hal represents a halogen atom,

or,

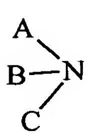


(Ib)

wherein:

R_4 represents a linear or branched (C_1-C_6)alkyl group,

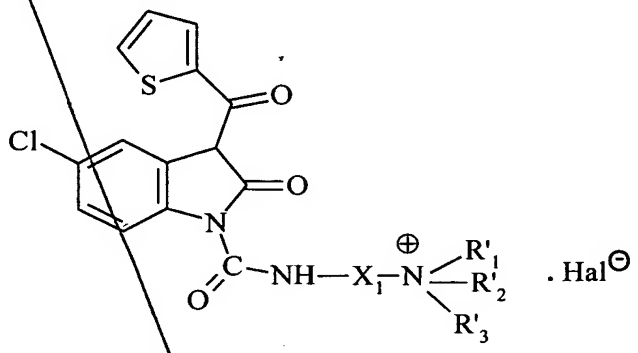
Hal represents a halogen atom, and



represents a molecule that can be used for the treatment or diagnosis of pathologies caused by attack on cartilage, wherein the nitrogen atom may optionally be included in a saturated or unsaturated nitrogen-containing heterocyclic system or included in a double bond.

21- A compound of claim 20, wherein the molecule M or  is selected from an antiinflammatory, an analgesic, an antiosteoarthritic, an antiarthritic and a specific anti-tumour agent.

22- A compound of claim 20 which is represented by formula (Ia_1) :



(Ia_1)

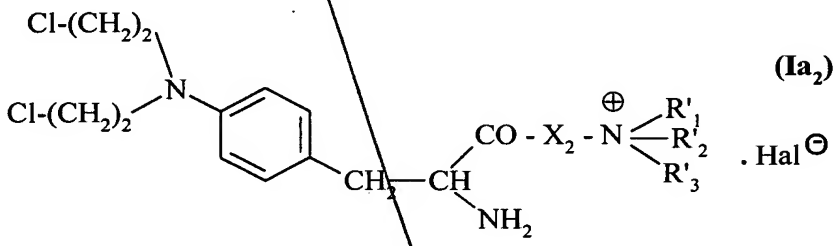
wherein :

X_1 represents a linear or branched (C_1-C_6)alkylene group,

R'_1, R'_2 and R'_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group, and

Hal represents a halogen atom.

23- A compound of claim 20 which is represented by formula (Ia_2) :



(Ia_2)

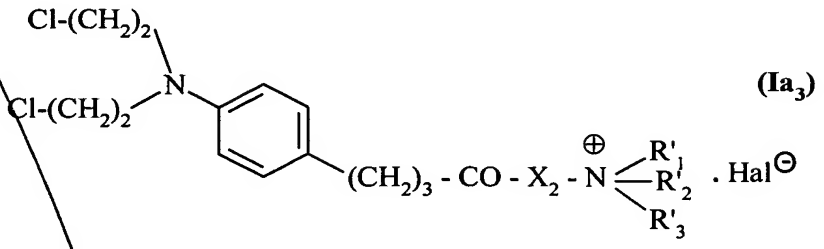
wherein :

X_2 represents a group -NH-$(CH_2)_m$- wherein m represents an integer from 1 to 5 inclusive,

R'_1, R'_2 and R'_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group, and

Hal represents a halogen atom.

24- A compound of claim 20 which is represented by formula (Ia_3) :



(Ia_3)

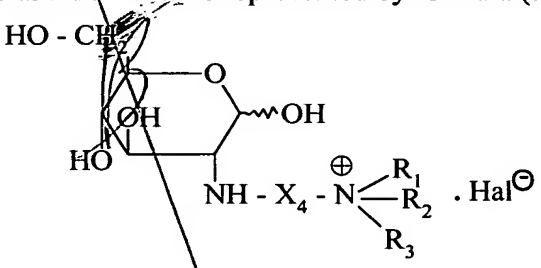
wherein :

X_2 represents a group $-NH-(CH_2)_m-$ wherein m represents an integer from 1 to 5 inclusive,

R'_1, R'_2 and R'_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group, and

Hal represents a halogen atom.

25- A compound of claim 20 which is represented by formula (Ia_4) :



(Ia_4)

wherein :

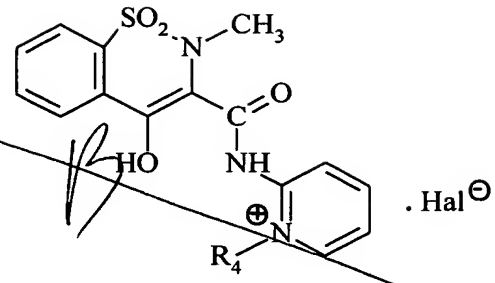
X_4 represents a group $-CO-(CH_2)_m-$ wherein m represents an integer from 1 to 5 inclusive,

R_1, R_2 and R_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group,

or R_1, R_2 and R_3, together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle, and

Hal represents a halogen atom.

26- A compound of claim 20 which is represented by formula (Ib_1) :



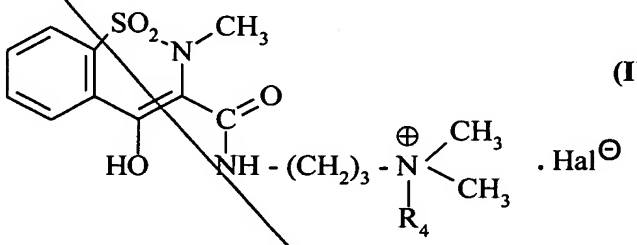
(Ib$_1$)

wherein :

R_4 represents a linear or branched (C_1-C_6)alkyl group, and

Hal represents a halogen atom.

27- A compound of claim 20 which is represented by formula (Ib_2) :



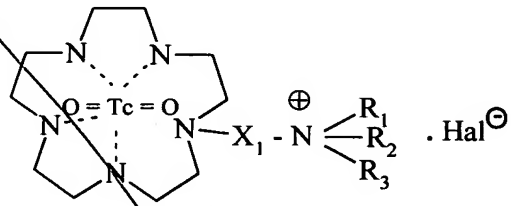
(Ib$_2$)

wherein :

R_4 represents a linear or branched (C_1-C_6)alkyl group, and

Hal represents a halogen atom.

28- A compound of claim 20 which is represented by formula (Ia_5) :



(Ia$_5$)

wherein :

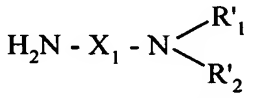
X_1 represents a linear or branched (C_1-C_6)alkylene group,

R_1, R_2 and R_3, which may be identical or different, represent a linear or branched (C_1-C_6)alkyl group,

or R_1, R_2 and R_3, together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle, and

Hal represents a halogen atom.

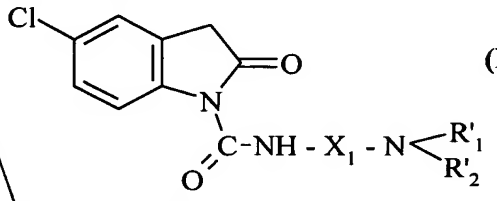
29- A process for the preparation of compounds of claim 22, wherein they are obtained from 4-nitrophenyl 5-chloro-2,3-dihydro-2-oxo-1*H*-indole-1-carboxylate, which is reacted with an amine of formula **(II)** :



(II)

wherein X_1, R'_1 and R'_2 are as defined in claim 3,

to yield a compound of formula **(III)** :

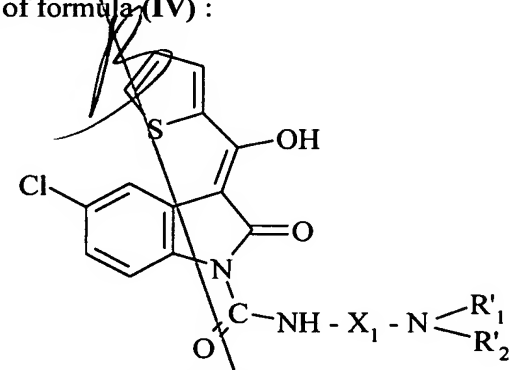


(III)

wherein X_1, R'_1 and R'_2 are as defined hereinbefore,

which is subjected to the action of 2-thenoyl chloride in a basic medium under an inert atmosphere, and then subjected to treatment with an acid,

to yield a compound of formula **(IV)** :



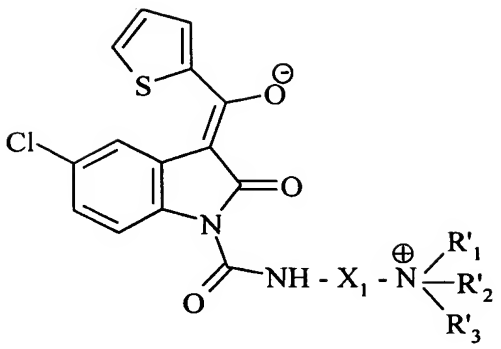
(IV)

wherein X_1, R'_1, and R'_2 are as defined hereinbefore,

which is converted into the corresponding sodium salt,

which is then subjected to the action of a linear or branched $(C_1\text{-}C_6)$alkyl halide of formula R'_3Hal (wherein R'_3 is as defined hereinbefore and Hal represents a halogen atom),

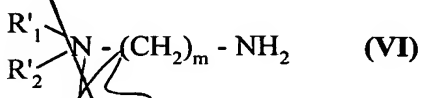
to yield a compound of formula **(V)** :



(V)

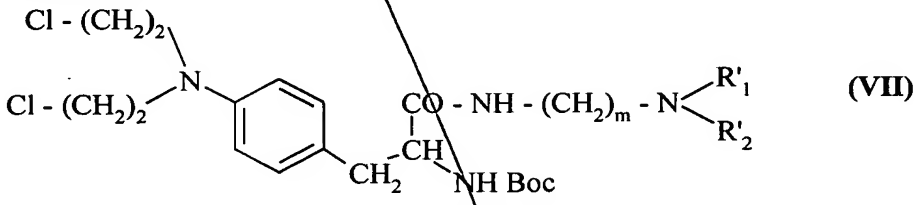
wherein X_1, R'_1, R'_2 and R'_3 are as defined hereinbefore,
which, in a hydrochloric medium, yields a compound of formula (Ia_1), which if necessary is purified.

30- A process for the preparation of compounds of claim 23, wherein these compounds are obtained from melphalan, the amine function of which has been protected beforehand by a *tert*-butoxycarbonyl group (Boc), using an amine of formula **(VI)** in the presence of a peptide coupling reagent :



(VI)

wherein R'_1, R'_2 and m are as defined in claim 4,
to yield a compound of formula **(VII)** :



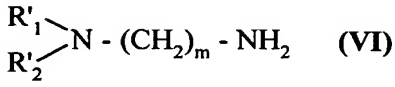
(VII)

wherein m, R'_1 and R'_2 are as defined hereinbefore,
which is then subjected to the action of a linear or branched (C_1-C_6)alkyl halide of formula R'_3Hal (wherein R'_3 is as defined hereinbefore and Hal represents a halogen atom), this intermediate is then subjected to treatment with HCl,
to yield a compound of formula (Ia_2), which if necessary is purified.

31- A Process for the preparation of compounds of claim 24, wherein these compounds are obtained from chlorambucil, the acid function of which is converted into the corresponding

acid chloride,

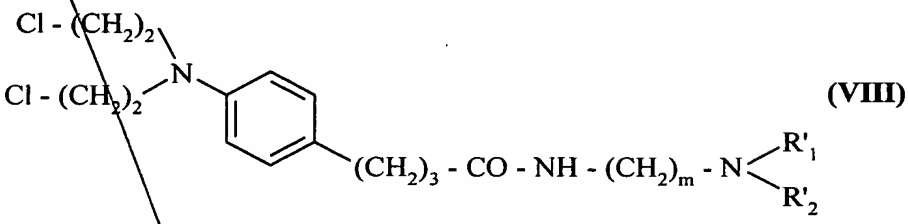
which is then reacted with an amine of formula **(VI)**, in the presence or absence of a peptide coupling reagent :



(VI)

wherein R'_1, R'_2 and m are as defined in claim 5,

to yield a compound of formula **(VIII)** :

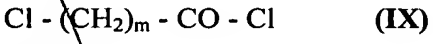


(VIII)

wherein m, R'_1 and R'_2 are as defined hereinbefore,

which compound is subjected to the action of a linear or branched (C_1-C_6)alkyl halide of formula R'_3Hal (wherein R'_3 is as defined hereinbefore and Hal represents a halogen atom), to yield a compound of formula (Ia_2), which if necessary is purified.

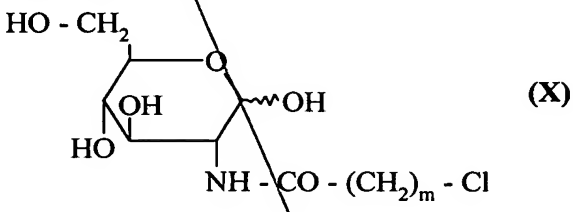
32- A process for the preparation of compounds of claim 25, wherein these compounds are obtained by reaction of glucosamine with an acid chloride of formula **(IX)** :



(IX)

wherein m is as defined in claim 6,

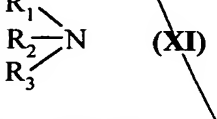
to yield a compound of formula **(X)** :



(X)

wherein m is as defined hereinbefore,

which is condensed with an amine of formula **(XI)** :

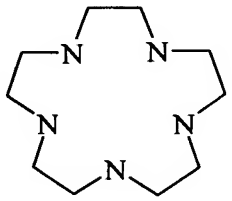


(XI)

wherein R_1, R_2 and R_3 are as defined in claim 6,

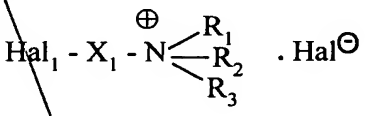
to yield a compound of formula (Ia_4), which if necessary is purified and which is optionally separated into its isomers according to a conventional separation technique.

33- A process for the preparation of compounds of claim 28, wherein these compounds are obtained starting from the compound of formula **(XII)** :



(XII)

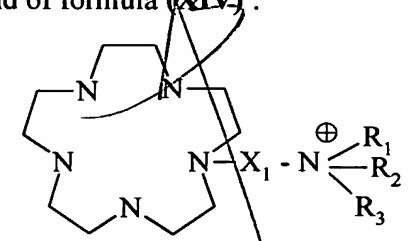
which is reacted with a haloalkylammonium halide of formula **(XIII)** :



(XIII)

wherein X_1, R_1, R_2 and R_3 are as defined in claim 9, and Hal and Hal_1, which may be identical or different, represent halogen atoms

to yield a compound of formula **(XIV)** :



(XIV)

wherein X_1, R_1, R_2, R_3 and Hal are as defined hereinbefore,
which compounds are reacted with sodium pertechneate in the presence of tin chloride,
to yield a compound of formula (Ia_5), which if necessary is purified.

34- The process for the preparation of compounds of claim 26, wherein they are obtained starting from piroxicam, which is reacted with a linear or branched (C_1-C_6)alkyl halide, and are if necessary purified.

35- The process for the preparation of compounds of claim 27, wherein they are obtained starting from the corresponding amine, which is reacted with a linear or branched (C_1-C_6)alkyl halide, and are if necessary purified.

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36- A pharmaceutical composition comprising as active ingredient a compound according to claim 20, alone or in combination with one or more pharmaceutically acceptable, inert, non-toxic excipients or carriers.

37- A pharmaceutical composition according to claim 36, comprising a compound according to claim 20, for use in the treatment of pathologies caused by attack on cartilage.

38- A pharmaceutical composition according to claim 36, comprising a compound according to claim 20, for use as a diagnostic reagent capable of revealing a pathology of cartilage or of metabolic origin.